Castlemaine Naturalist

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Monthly newsletter of the Castlemaine Field Naturalists Club Inc.

Jelly Bells *Heterotextus peziziformis*, Kalimna
photo by Noel Young

The old-growth moss forests of Antarctica

Dr Melinda Waterman described how climate change is impacting the moss beds near Casey station, East Antarctica.

Our guest speaker for the July meeting was Dr Melinda Waterman, post-doctoral researcher at the University of Wollongong. Together with Prof. Sharon Robinson, Melinda has been researching the moss beds at the Windmill Islands, East Antarctica for the last 2 decades or more.

Melinda began her presentation with some general background on the geography of Antarctica, noting that Antarctica holds 70% of the planet's fresh water in the form of ice and snow but that only about 1% of the coast line is ice-free.

Broadly, the Transantarctic Mountains divide the continent into West and East Antarctica. In East Antarctica the Australian research base, Casey station, lies on the coast alongside the Windmill Island group 3422km from Hobart.

By Krill Oil, Krilloil.com, CC0, https://commons.wikimedia.org/w/index.php?curid=23043354

Australia claims 42% of the Antarctic land mass and is therefore responsible for the protection of that area in addition to upholding the conditions of the Antarctic Treaty. Travel around the station and extended area is by motorised Hägglunds (motorised dual-cab tracked over-snow vehicles), inflatable boats, helicopters or skis.

Wildlife in the area includes penguins, whales, seals, skuas and more. Plant life around Casey is dominated by Bryophytes – mosses, liverworts but not hornworts. The two vascular plants on the continent are found along the peninsula in West Antarctica.

Of the 100+ global species of moss found in the world, three species are located around Casey:

Schistidium antarctici, (SA) is found only in Antarctica but has cousins in Australia.

Bryum pseudotriquetrum (BP) and *Ceratodon purpureus* (CP) are cosmopolitan species. All species are colonised with tardigrades (water bear or moss piglet), mites and springtails.

The three moss species are variably adapted to desiccation and rehydration as water freezes and melts through winter and the short summer. Water availability is the principal factor influencing the distribution of these species. SA is water-loving, less tolerant of desiccation and is found in the melt water laying in shallow areas of the moss mounds/cushions. CP does not survive extended submergence, is more desiccation-tolerant and is found on the upper drier crests while BP is spread across both areas of the moss beds. This was the distribution pattern recorded from 1982 – 2000 (Fig. 1).

Moss beds in East Antarctica's Windmill Islands. Photo Sharon Robinson.

Subsequent observations through to 2013 identified that areas of the healthy green moss had turned red, brown or grey indicating that the plants were under stress and dying, e.g. in 2008.

Moss beds, with moss in the foreground showing signs of stress. Photo Sharon Robinson

Studies showed that the stress was being caused by drying effects and that CP and BP were displacing SA at the lower levels (Fig. 1).

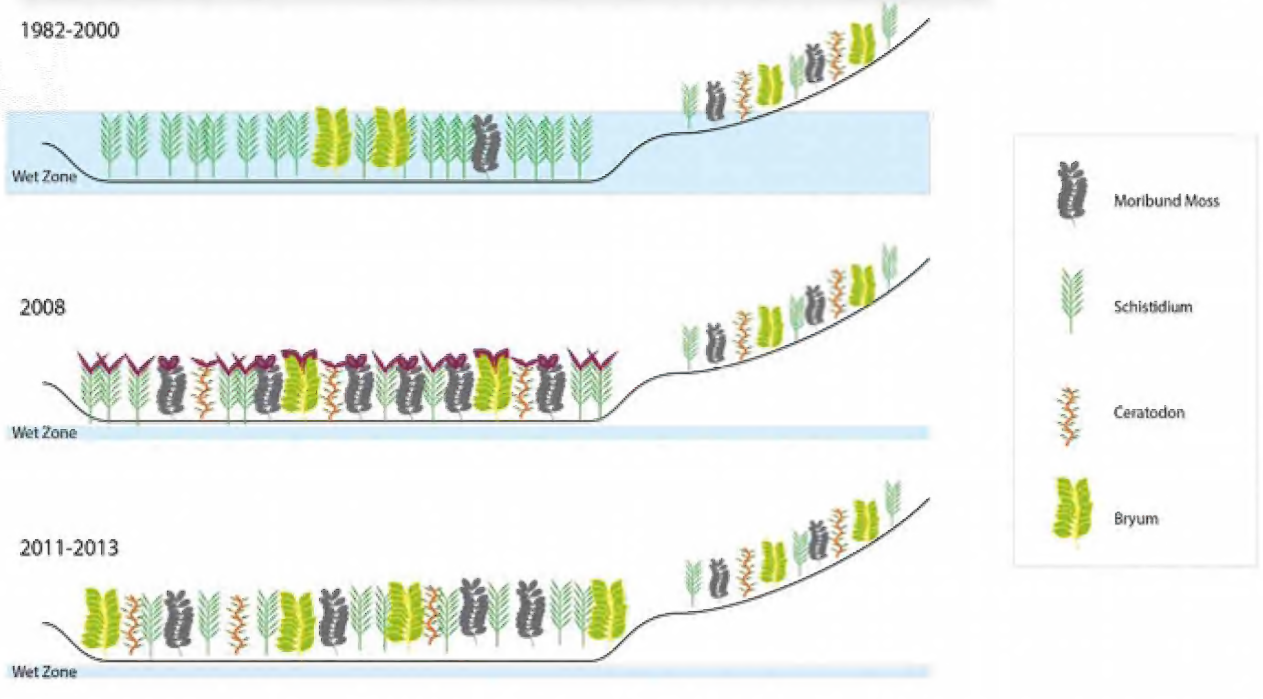


Figure 1 showing the shift in species distribution in the Casey area from 2000 to 2013.

The development of red-brown pigmentation indicates a change from normal growth (normal green chlorophyll pigments) to reduced photosynthesis, also consistent with stress factors in microclimates (i.e. the microclimate within the moss beds). This is depicted in the 2008 time-frame in Fig. 1 above.

Since the early 1980s, the depletion of the ozone layer due to the increase release of ChloroFluoroCarbons (CFCs) into the atmosphere has been most dramatic over

Antarctica. Two of several effects of the 'ozone hole' have been an increase in earth surface levels of UV-B radiation and a shift of the westerly jet stream closer to the continent making East Antarctica cooler and drier.

The increase in the red UV-B absorbing pigments in the cell walls in response to stressful conditions act as a protective sun screen against high levels of UV-B radiation. Mosses which had lost all pigments in the tips appear grey or black in colour and are described as moribund.

A further method to determine if a drying trend is happening is to measure the ratio of the stable isotopes of carbon (^{12}C and ^{13}C) absorbed by the moss tissues during photosynthesis.

Analysis has shown that mosses fix more $^{12}CO_2$ than $^{13}CO_2$ during photosynthesis when the leaf surfaces are dry. When the moss surface is submerged in a layer of water, more of the $^{13}CO_2$ is incorporated. The change in the measured ^{12}C / ^{13}C ratios in moss shoots sampled from the control quadrat sites correlate with changes in bioavailable melt water.

Melinda explained that Antarctic moss can be at least 100 years old. Using radiocarbon dating techniques, some species of moss were found to grow as little as 1mm per year. Tracing the change in carbon-13 over this time is evidence that these old-growth, slow growing plants have been drying since the 1960s.

Added note: Different carbon pools have different signature ratios of the stable isotopes of carbon, ^{12}C and ^{13}C – atmospheric carbon as carbon dioxide, in the oceans, in the terrestrial biosphere (land plants, animals and soils) and in fossil fuels.
Reference: Global Monitoring Laboratory (GML) of the National Oceanic and Atmospheric Administration (NOAA)

Similar to deep ice cores capturing and recording climate variations over millennia, this research is demonstrating that rapid vegetation change is occurring in East Antarctica and that the moss beds are proxies for monitoring coastal climate change.

Melinda finished the evening acknowledging that it is unclear how long this drying trend, as recent as 2018, will continue as the ozone hole slowly recovers, and heat-wave anomalies and warming trends become more frequent, not only in West Antarctica but also now in East Antarctica. How will this affect the global climate and the moss beds of East Antarctica in the future?

– Jill Williams

Birds of Sutton Grange July 2022

Nigel Harland

Superb Fairy-wren
Australian Raven
Sulphur-crested Cockatoo
New Holland Honeyeater
Red Wattlebird
Grey Currawong
Brown Falcon
White-browed Scrubwren
Laughing Kookaburra
Long-billed Corella
Welcome Swallow
Galah
Eastern Rosella
Australian Magpie
Yellow-tufted Honeyeater
Crimson Rosella
Common Bronzewing
Striated Pardalote
Eurasian Blackbird

Excursion to Muckleford Forest and Red White and Blue Mine

Peter Turner

Our July excursion started at the end of Muckleford School Rd, where Bells Lane and Talbot tracks head into the Muckleford State Forest. We checked the large farm dam and surrounds for birds then drove about 500m along Talbot Track to wander the hillside east of the track for plants of interest, heads down and cameras at the ready. The mosses and lichens stood out wherever we looked. This part of the forest has been cleared of many smaller trees during DELWP's annual firewood collection program, and gives an indication of the lightly-wooded appearance described by early European explorers of the area.

Moving on, we turned onto Dunn's Reef Track and parked by the track to the mine, On the south side of the road we found many large clusters of greenhood leaves, with a few Nodding Greenhoods just coming into flower. On the north side the hillside was carpeted with bright green mosses. Euan spotted a length of rotted wood covered with fungi – which on close inspection were seen to be the spectacular Bird's Nest fungi, new to many of us.

We then drove down Red White & Blue Track, past dense growth of *Grevillea alpina* to Bells Lane Track, where DELWP's Strategic Fire Break Team's contractor has mulched a 10m wide break along the north side of the track, starting within the Nature Conservation Reserve, and continuing almost to the Newstead-Maldon road. The SFB team consulted with members of FOBIF, Muckleford Landcare and our club while preparing for this work, and a few small areas with important plant species were not mulched. But the rest has had a close shave almost to the ground. Two questions - how well will the vegetation recover, and why is the Forest Fire Management team now proposing a much wider planned burn all along Bells Lane Track?

At the junction of Bells Lane and South German tracks, Phil and Judy Hopley showed us an isolated daisy bush, reported by Frances Cincotta in May 2020 as *Olearia floribunda* (https://www.fobif.org.au/2020/05/new-find-in-muckleford-forest/). This daisy had not been reported in our district before but is now entered in the *Castlemaineflora* website (see also ref. 3). And under a tree by the road, amongst gravel, Geraldine discovered a cluster of Dwarf Greenhoods in flower, illuminated by the late afternoon sun. We completed our afternoon with a cuppa at the Red White & Blue Mine picnic area. Thanks to Euan for the list of birds recorded for the afternoon, and Geraldine for the plant list.

References

1 Muckleford Forest Walk to the Red White and Blue Mine (Ern Perkins, 1999); Muckleford Forest Plant List (E. Perkins, 1999) – leaflets available at the Information Centre)

2 https://www.ffm.vic.gov.au/__data/assets/pdf_file/0016/26305/FS0070-Red-White-and-Blue-Recreation-Site.pdf

3 https://vicflora.rbg.vic.gov.au/flora/taxon/31039150-6727-4b77-bc43-e3c06d00fea6.

Plants noted

Glossodia major (leaves)	Wax-lip Orchid
Juncus remotiflorus	Diffuse Rush
Lomandra sp.	Mat-rush
Pterostylis parviflora/rubescens (leaves)	Tiny/Red-tip Greenhood?
Pterostylis nana (flowering)	Dwarf Greenhood
Pterostylis nutans (flowering)	Nodding Greenhood
Thysanotus patersonii	Twining Fringe-lily
Acacia acinacea	Gold-dust Wattle
Acacia genistifolia	Spreading Wattle
Acacia pycnantha	Golden Wattle
Styphelia humifusa	Cranberry Heath
Brachyloma daphnoides	Daphne Heath
Cardamine hirsuta	Common Bitter-cress
Cassinia sifton	Coffee Bush/Drooping Cassinia
Drosera aberrans	Scented Sundew
Einadia hastata	Saloop
Einadia nutans subsp. Nutans	Nodding Saltbush
Exocarpos cupressiformis	Cherry Ballart
Gonocarpus tetragynus	Common Raspwort
Grevillea alpina	Downy Grevillea
Hardenbergia violacea	Purple Coral-pea
Hydrocotyle laxiflora	Stinking Pennywort
Olearia floribunda	Heath Daisy-bush (local?)
Pultenaea largiflorens	Twiggy Bush-pea
Senecio phelleus	Purple-leaf Groundsel
Veronica plebeia	Trailing Speedwell
Xerochrysum viscosum	Sticky Everlasting

Birds noted

Australasian Grebe	2
White-faced Heron	1
Eastern Spinebill	1
Yellow-faced Honeyeater	3
Yellow-tufted Honeyeater	1
Red Wattlebird	20
Fuscous Honeyeater	7
White-eared Honeyeater	1
White-naped Honeyeater	3
Brown-headed Honeyeater	3
Black-chinned Honeyeater	1
Spotted Pardalote	1
Weebill	1
Grey Shrikethrush	1
Australian Magpie	4
Grey Currawong	1
Grey Fantail	1
White-winged Chough	1
Scarlet Robin	1

Nodding Greenhood *P. nutans*
Below: Dwarf Greenhoods *P. nana*
Photos: Judy Hopley

Moss covered hillside. Photo: Peter Turner

Strategic Fire Break along Bells Lane Track.
Photo: Euan Moore

Bird's nest fungi *Crucibulum leave.* Photo: Euan Moore Observations - Photo: Jill Williams

July Observations (1944)

George Broadway

In July 1944 the end of the war was on the horizon although that horizon was still far distant.

As Churchill said, "It may not be the beginning of the end, but it is the end of the beginning". Or words similar to that.

In Wildlife magazine the argument concerning Lyrebirds continued. Is the Lyrebird a pest? Apparently in 1944 there were still people who thought so. Among difficulties early settlers had to contend with, one of them was Lyrebirds scratching up the soil, as Lyrebirds do, and while so doing scratching up newly planted seeds. It was shot and destroyed by the score and "sufficient tails were obtained to decorate the mantel-shelves of nearly every cottage in the colony".

Surely in 1944 it was argued, it should be possible to set aside sufficient areas of Lyrebird habitat to ensure its survival, or do we have to add it to the growing list of fauna which have gone extinct since the arrival of European settlers.

I am at present reading an account of a trip made by a school inspector through western Victoria in 1857. Near Terang he describes how the squatters and farmers regarded the Wedge-tailed Eagles as their enemy being certain that they were responsible for taking young lambs. In this edition of "Wildlife" (July '44) Crosbie Morrison describes how some farmers were still waging war against "Eagle-hawks" as they called Wedgies. In his editorial he points out that the Wedgie is responsible for controlling large numbers of rabbits and rats and the taking of a lamb would be a very rare occurrence. In the Terang district in 1857 Wedgies were being shot and poisoned in their dozens.

So what interesting items did our readers of "Wildlife" manage to find in July 1944? I am afraid many items which had turned up before. However one item is of particular interest to me. Looking down the list I noticed a name I recognised, that of one of our good friends in Castlemaine, then a schoolgirl in Doncaster. It seems that her class had been encouraged to send in specimens to "Wildlife".

Hence item number one under

Insects;

Alice from Doncaster: Cottony Cushion Scale, a scale insect or mealy-bug that normally infests Acacias but has transferred its attention to citrus trees with disastrous results. When carried by accident to California it threatened to wipe out the citrus industry until it was controlled by a parasitic wasp introduced from Australia. (As a teacher of Biology I used to quote this and the control of Prickly Pear in Australia as good examples of

Biological control of pests. Unfortunately the Queensland Cane Toad is an example of what can happen when stringent tests are not applied to a potential control agent and it itself becomes a pest).

Pascoe Vale: Firewood Beetle or Longicorn Beetle, *Phorocantha tricuspis.* Frequently sent in. At this time of year many people in 1944 would have been bringing in firewood.

Also from Moonee Ponds

Gardiner: Pigmy Mantis Lacewing, a very small member of the Lacewing tribe, with forelegs like a miniature preying mantis. They feed largely on spiders' eggs, and are found where spiders congregate.

Monbulk: Gum-leaf Grasshopper *Caedicia olivacea.* Beautifully camouflaged as a gumleaf.

Unknown: The lump of dried mud with the holes in it is the nursery of our largest Mason Wasp *Abispa*. The cells are stocked with paralysed spiders or caterpillars to serve as fresh meat for the wasp larvae.

New Guinea: (A serviceman). The black beetle is a scavenger, one of the Rhinoceros Beetles. The other with the squeaky voice was one of the largest and most decorative of the Longicorn Beetles.

Pascoe Vale: Caterpillar of the Footman Moth, a nuisance on several types of garden plants.

Albert Park: The creature whose reactions "put the wind up" was Saunders Case Moth. (I can't imagine what it must have done to produce this effect)

Preston: Rhinoceros Beetle, *Bolboceras sp*. Like its Scarab relatives it is a scavenger of dead organic material, so useful.

Armadale: a little fat-bodied black Preying Mantis. There are more different varieties of Mantis than most people realise.

Caulfield: One of the commonest boring beetles, *Lictus brunneus.*

Glenormiston Sth: Golden Brown *Paropsis* Beetle. One of a group of High-domed leaf-eating beetles.

General

Albert Park: I am inclined to think that the creature that bit your nephew's lip would be one of the small centipedes, not Johnny Hairylegs AKA the House Centipede *Scutigera*. Some centipedes may be capable of biting through tender skin, but I don't think Scutigera would be capable.

Heidelberg Military Hospital: *Scutigera* again, useful to have around if there are unwanted insects that need to be disposed of.

Specimens also from Doncaster, Bogong and Ballan.

Port Melbourne: The "Prawn-killer" *Ibacus.* A member of the crayfish family but flattened for living on the bottom amongst seaweed and feeding on smaller crustaceans. Described Aug '19

Mt Dandenong: A small scorpion, light in colour because it had recently moulted.

Dromana: The small crustacean recovered from a sac inside a fish is the Fish Louse, *Bopyrus.* There are several kinds, all Amphipods, related to the little sand hoppers one finds on the beach under washed-up seaweed. They may cause the fish to be thinner, but do not affect the eating quality. See Feb '20

St Kilda: Your starfish were the kind known as "Biscuit Starfish", *Pentagonaster.* They are not uncommon in rock pools around the coast of Victoria. [Photo right]

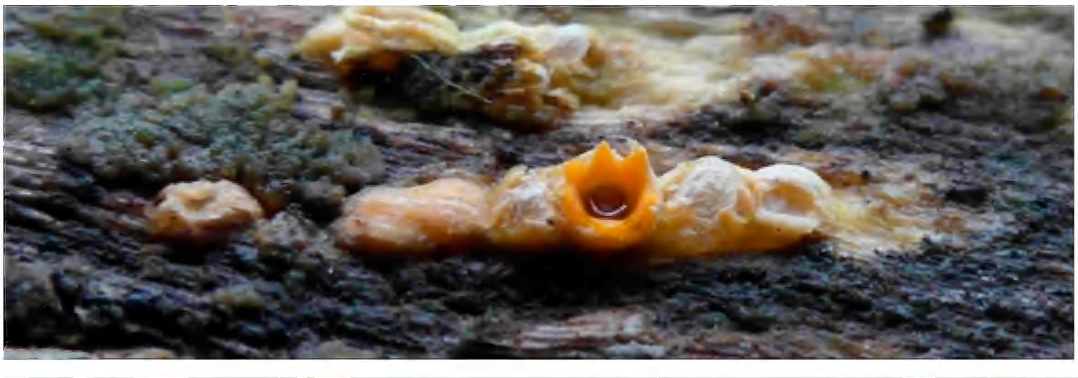
The Amazing Cannonball Fungus *Sphaerobolus stellatus*

Mez Woodward

My first observations of this remarkable fungus were in mid-June. Clambering around in wet and very cold weather, the tiny (2 mm) fruiting bodies could be spotted along the upper and side bark of long-fallen trunks and larger branches of eucalypts. They seemed to prefer the steeper south-facing woodland slopes.

I have since learned that the spore release and dispersal process of Sphaerobolus is unique and quite amazing. Firstly the outer pale yellow membrane of the spherical fruiting body splits radially from the top to create the yellow toothed cup seen in the photos. The reddish-brown peridioles (spore capsules), also visible, sit loosely in fluid within the cup. At maturity, the inner membrane of the cup rapidly everts, ejecting the peridiole up to 6 metres away! It sticks firmly on impact and germination at a new site is assured.

The now empty cups can be found with partially collapsed or still fully everted membranes – often exquisitely beautiful as in photo 3, caught in a brief sunbeam between the rains. Photo 2 shows the progression (left to right) - immature pale spheres, peridiole sitting ready for ejection, empty cups with everted membranes.



Help for Frogs!

Judith Nimmo

Australian frogs are dying en masse again, particularly on the east coast of Australia! The Australian Museum has put out an urgent appeal for help in identifying the cause of these deaths. Multiple species of frogs are affected, some already threatened. This is our chance to contribute to this important project. Zoos Victoria is also supporting this appeal.

A dead, discoloured green tree frog, The Conversation, June 2022

The museum is requesting observations of any sick or dead frogs including location and photographs to be emailed to the Australian Museum's citizen science frog project via calls@frogid.net.au

We are also urged to continue submitting our recordings of frog calls using the FrogID app to help monitor what is happening to Australia's frogs. The frogID app can be downloaded for free from the Australian museum or your app store. This app is a great way to learn about the frogs in our area, as users receive a return email identifying the frog species that were recorded.

More information on this serious conservation issue (including a webinar) and how we can help can be found on the Australian Museum website.

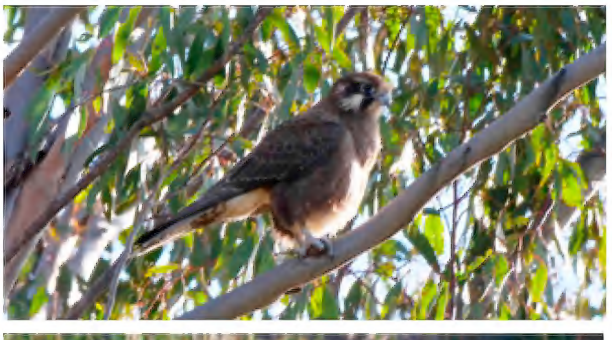
Happy Valley track, July

Noel Young

This stretch of Forest Creek, replanted by Castlemaine Landcare over many years, has become a haven for lots of our birds, and a popular walking track. Apart from predictable residents, you may encounter visitors passing through, like the two shown here.

Right: A Brown Falcon and a Little Pied Cormorant checking out the area.

Below: part of the now tree-lined Forest Ck.



COMING EVENTS

MONTHLY MEETING: Joint meeting with Birdlife Castlemaine District
Friday 12th August, 7.30pm by Zoom (see details for joining on the back page)

Speaker: Tanya Loos, Nature writer and science communicator
"Window strike: when birds hit windows"

Window strike is a huge problem for common birds - as well as threatened species such as the Swift Parrot and Powerful Owl. Many of us have had the unfortunate experience of a thud or even a crash as a bird in rapid flight collides with a window at home. The good news is there are easy steps you can take to prevent this happening.

Photo: Swift Parrot by Michael Gooch

The meeting will be held by Zoom. All are welcome. If you have not joined earlier webinars and wish to attend, please email Peter Turner at munrodsl@iinet.net.au

Our guest speaker will follow the usual 'observations' session when members can share recent interesting sightings with an option to show a photo or two. If you have photos for the meeting, please email JPEG file(s) to **Jill Williams** at jilliwill33@gmail.com by noon on the day of the meeting.

EXCURSION: Saturday 13th August, 1.30 pm "Eureka Reef"

Leaders: Marli Wallace & Noel Young

Wildflowers, birds, aboriginal and mining history. This was a significant place for the Dja Dja Wurrung people before becoming a major gold mining area. Twenty one sites around the 1.8 km circuit track (a bit rough in places – walking pole useful) will be described, with wildflowers, regrown woodland and birds to be observed along the way. You can read more about the Eureka Reef walk in this Parks Victoria brochure.

Eureka Reef. *Photo by Noel Young*

Meet: 1.30 pm at the Octopus (Duke St, opposite the Castle Motel) or 1.50 pm at the Eureka Reef car park, down a short track on the right off Dingo Park Road just past the Poverty Gully Reservoir Track (if you are heading south). Dingo Park Road is the extension (after the railway line) of Eureka Street, which runs south from the Pyrenees Highway just before the Chewton Shell Service station.

Bring: Binoculars, water, afternoon tea, sturdy shoes and hat.

The Field Trip will be cancelled in extreme weather conditions.

Disclaimer: The opinions expressed in this newsletter are those of the contributors and not necessarily those of the club

Castlemaine Field Naturalists Club

PROGRAM

Monthly meetings are being held on-line via Zoom during the winter months, commencing at 7.30pm. If you have registered for our previous webinar meetings you will be sent the link for registering with Zoom. If you have not joined before and wish to attend, please email Peter Turner at munrodsl@iinet.net.au

Excursions are on the Saturday after the monthly meeting. Meet at the Octopus (opposite the motel in Duke St) for departure at 1.30pm unless otherwise advised.

Fri August 12 Meeting 7.30pm: Tanya Loos "Window strike: when birds hit windows". Combined meeting with Birdlife Castlemaine District

Sat August 13 1.30pm: "Eureka Reef walk" Leaders: Marli Wallace and Noel Young

Fri Sept 9 Meeting 7.30pm: Nick Deacon (Deakin Uni) "Powerful Owl ecology - comparison of rural and forested environments"

Sat Sept 10 Excursion 1.30pm: "Orchid search in the Castlemaine region" with Julie Radford

Fri Oct 14 Meeting 7.30pm: Georgie Custance "The Fryerstown Grevillea (*Grevillea obtecta*) – a threatened species in our area"

Sat Oct 15 Excursion 1.30pm: Georgie Custance "*Grevillea obtecta* project – learn how to identify and record sightings of this rare species in the field"

Club website (Web master: Ron Wescott) - www.castlemainefieldnaturalists.org.au

Castlemaine Naturalist - email newsletter material to: newsletter.cfnc@gmail.com

*Deadline for the September edition is August 26

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2022 Committee

President:	Peter Turner	5470 6891
Vice President:	Euan Moore	0407 519 091
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Treasurer:	Geoff Harris	0418 392183
Editors:	Jenny Rolland	Noel Young 5472 1345
Committee:	George Broadway	5472 2513
	Cathrine Harboe-Ree	0438 366 674
	Judith Nimmo	0419 386 015
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Castlemaine Field Naturalists Club Inc. PO Box 324, Castlemaine, 3450.
Inc #A0003010B